

AMERICAN VETERINARY REVIEW,

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EDITORIAL.

OUR EMBARRASSMENTS.—Dilemma hard to solve—our summer vacation (?)—large amount of material in hand—crowd of interesting subjects—we must postpone their consideration, or our readers suffer—time is wanted. **ARMY VETERINARY LEGISLATION.**—We cannot, however, present ourselves before our friends without a word on that subject—Dr. Griffin's communication—the new bill offered—suggestions as to its passing Congress—cash may be necessary—let a fund be established and placed in the hands of the United States Veterinary Medical Association—we shall be pleased to hear responses on the subject and gladly open the subscription list. **AMERICAN PUBLIC HEALTH ASSOCIATION.**—The meeting takes place this month.

OUR EMBARRASSMENTS.—We find ourselves just now confronted by the worst dilemma it has been our fortune to encounter since the beginning of our editorial life and experience. Returning home from beyond the ocean, after what was intended to be a restful vacation, but which proved to be a period of constant and laborious activity, we find ourselves on the day when we should be quite ready for the issue of our October number, with but the scantiest amount of material in shape for publication and of interest to our readers, and are driven to the necessity of tendering the largest kind of an apology for a dereliction which we cannot deny and could not avoid. Our October issue this year ought to have been one of exceptional interest in both the quality and quantity of its contents. A crowd of interesting subjects require our notice, including a report of the proceedings of the Fifth International Veterinary Congress, Annual Meeting of the United States Veterinary Medical Association, re-opening of

the Colleges, and what more we need not stop to say. But the day of publication looms upon the calendar before our eyes, and we had almost said our courage fails us as we contemplate the misfortune of our inability to meet the readers of the REVIEW nearly, or quite on time as usual. With the hope that with their usual indulgence they will overlook an apparent neglect on our part, and offering them in return the assurance of full and careful attention to the important subjects which we have already mentioned, at an early date, we stand ready to respond with our best acknowledgments to the kind consideration which they stand ready to extend, and which we are already prepared to receive.

ARMY VETERINARY LEGISLATION.—Though embarrassed by lack of room and time, there is a subject which we feel that we cannot suffer to pass by without mention at this time. It is an important subject, and one which interests the *American veterinary profession* at large, in the person of their brethren who labor in the national army. It is true that we cannot at the present time present our views in such a manner as we desire to, but upon reading the communication of our worthy correspondent, Dr. G. E. Griffin, we feel impelled to say that the army veterinarians appear to have found in him the man who, if assisted by those who are interested, and by the profession at large, will be likely to succeed in obtaining for our colleagues in the army such a recognition as is due to their calling. The work necessary to be done, however, will consist in something more than the presentation of a suitable bill. Its passage will not prove to be a matter-of-course routine affair, but will only be secured by the hardest kind of a lobby fight against the objections of supercilious army officers and members of the West Point aristocracy *and their wives*. It will require much personal effort, and not a trifling expenditure of time, money, argument, persuasion and influence. Among other things, a fund of available cash will certainly be indispensable, to be disbursed under proper control and management; and with this object in view we would suggest the immediate opening of a subscription to be placed in the hands of the Committee on Army Legislation of the

United States Veterinary Medical Association. We shall be pleased to hear the views of our brethren on this subject, and shall be happy to appropriate the necessary space in the pages of the REVIEW for the publication of the names of subscribers to the fund. And if no one else cares to head the list, we shall feel honored in being permitted to do so with our own check.

AMERICAN PUBLIC HEALTH ASSOCIATIONS.—By special request we call the attention of our friends to the notice of the coming meeting of the American Public Health Association, which is to be held during the present month in Brooklyn. We hope to do better justice to the request of the chairman, Dr. J. H. Raymond, in our November issue; he will, with his usual kindness, excuse us at present for reasons we have already stated.

ORIGINAL ARTICLES.

GLANDERS IN MAN AND BEAST.

By P. PAQUIN, M.D., V.S.

A recent accident in dealing with that disease, and of which the REVIEW gave editorially such kindly notices, prompts me to write a short article on the subject. I intended to do so later, as I am engaged in some slow original researches concerning glanders, but the many conflicting and erroneous notices of the press about the accident in question, and the apparent confusion that seems to exist in the minds even of the most conspicuous of veterinarians and physicians about the nature of the disease, have determined me to delay no longer at least a few words.

For reasons without foundation, the popular idea that glanders in man *must necessarily be fatal* seems as prevalent among veterinarians as among the laity, so much so that some of the leading men have expressed this view in unmistakable terms in letters to me and in the press. Does this come from the fact that nothing really new has appeared of

late on this subject in veterinary literature, or is it because of a sort of lethargy that makes us take for granted the writings, sayings and popular notions of old time? It is, perhaps, well in practice to acknowledge the incurability of any disease of a deadly character when science and practice point towards such a conclusion, but is that a reason why medical men must stop and accept for granted this conclusion? What is there absolute in disease? If since the beginning of the world a disease was found uncontrollable, is it a reason to stop our inquiries and accept views a century old? Hydrophobia was beyond the reach of human skill once; is it not now mastered? It is a grave error that medical men make when they pronounce a diagnosis of fatality just because the disease under treatment is known to the world as incurable. Now I say without further comments that *glanders in man* is sometimes curable, and that even in the race of animals most susceptible, it occasionally takes a form in which *without treatment*, contagion becomes impossible at least for a time. I will proceed to give evidence.

Take Ziemssen's "Cyclopedia of the Practice of Medicine," Vol. III on chronic and infectious diseases, pages 352 and 368 (American edition, published by Wm. Wood & Co., New York, 1875, edited by Albert H. Buck, M.D.) There you will find sufficient evidence I think to convince the most skeptical, that *glanders* is not necessarily deadly. Ziemssen there gives the following tabulation written by Bollinger:

In thirty-eight cases of *acute glanders* in man, recovery ensued in one instance. In seven cases of *subacute glanders*, recovery in two instances. In thirty-four cases of *chronic glanders* recovery in seventeen instances.

Bollinger assigns an "absolutely unfavorable diagnosis in *acute glanders* only; the subacute and chronic forms permitting a relatively *favorable* opinion as to the termination." Out of a total of one hundred and twenty cases of *glanders* in the human subject that he "succeeded in finding," the recoveries were equivalent to twenty-three per cent. In the same pages it will be found that Hauff gives account of 11.4 per cent. of recoveries; that Virchow acknowledges some

cures and that in a word glanders should not, in man, be considered always mortal. The article on glanders in Ziemssen's work is based on the authority of nearly fifty writers, among whom we find those previously mentioned, plus Greve, Kreutzer, Spinola, Gerlock, Bouley, Lafosse and others, whose names are well known to medical science.

In support of this testimony I might add the following two positive cases of glanders in man, both of whom are living to-day. The first occurred in 1887, in the fall of that year. I was called to Burlington Junction, Nodaway County, Missouri, to attend officially to a contagious disease among stock. I found eight cases of glanders in four different farms, nearly all adjoining. All the cases come from or had been contracted at one and the same place originally. One of the owners, whose name is Hiram S. Pierce, had treated his two diseased horses and had been inoculated through a raw sore on the left hand. Virus from his horse's nostrils killed guinea pigs with glanders in five weeks and seven weeks respectively. I had the horses killed. Mr. Pierce had then been in possession of them only a few weeks, if I remember well. He had received them in trade from a man who called the disease distemper. He had treated them not longer than four weeks, and when I saw him he had had symptoms of glanders about fifteen days. The physician he consulted did not understand the case and so the patient was not much alarmed by the uncertain prognosis. I found induration of lymphatic courses in the affected arm, suppuration of the epitrochlear gland at the elbow and suppuration of farcy character at the foot on the same side. The man walked to the field with me without a shoe—he could not put one on—and limped slightly. His father lived in, and was the honorable representative of Logan County, Ill.,—the papers said. Mr. Pierce went there and was examined and I was informed that the virus was tested by Dr. Rouch, Secretary State Board of Health of Illinois. He pronounced the case glanders. Then Doctor Leeds, of Lincoln, Ill., took charge of the case, and here is his letter in reply to a recent inquiry of mine concerning it.

LINCOLN, ILL., June 6, 1889.

J. H. Rauch, M.D., Springfield.

Dear Doctor.—In reply to Dr. Paul Paquin's letter, forwarded to me and herewith enclosed, I first saw the case mentioned, (H. S. Pierce affected with glanders), in November, 1887. Mr. Pierce was under my observation from that time till April, 1888. When first seen he had a "running sore" on the left arm at front of elbow, one near the left knee and one near the left ankle. Much stiffness and considerable swelling of the limbs involved.

For local treatment I used iodoform powder on the ulcers and applied rubber bandages. Internally, Syr. Fer. Iod. f. 3 j. t. d. and Fowler's solution, beginning with m. v. t. d. for two days, then m. vj. two days, and so on till ten drops were taken, then decreasing the dose in reverse order and repeating.

I take pleasure in reporting that Mr. Pierce has *completely* recovered his health. He is free from stiffness in the limbs and has his normal strength. His complete freedom from symptoms has now continued just about one year.

Courteously,
L. L. LEEDS,
Per K.

The other case is one now in charge of Dr. Griffith, member of the Missouri State Board of Health, Kansas City, Mo. He contracted glanders in 1887, I think, and is still living. I saw Dr. Griffith in May at the Missouri Medical Association meeting, Springfield, Mo., and he informed me that the patient is doing fairly and at work. His lymphatic system, however, is still affected and presents chronic lesions. The case and its history I know well through Dr. Griffith, and it is undoubtedly glanders. Now as to my own case I will neither assert nor deny that it was glanders, but the trouble I know was due to inoculation of matter from a mare which had glanders decidedly pronounced. The same matter inoculated to two guinea pigs by a student here, killed one some fifteen days or so afterwards and the other in about six weeks. Both died in my absence, and as I had left in great hurry and had made no arrangements for preserving the specimens or for close examination, I cannot say what was the cause of death; besides I was not told of the death of the guinea pigs until after my recovery. The mare died, as did three other horses and mules on same farm, all from glanders.

It was on the 22d day of March, at Lees Summit, Mo., that the accident occurred. While examining the mare just mentioned, she blew her nose, and a great deal of matter cov-

ered a good portion of my face, my right hand and wrist, and some struck the right cuff inside and outside. The cuff was very stiff, and was immediately scraped with my pocket knife after washing off the besmeared hand and face well. It was about eleven o'clock, A. M., and I resolved to wash better and take the cuff off before dinner, having then one more animal to examine. However I forgot to take it off, and rode a whole afternoon with it on. That night at ten o'clock I was about to retire for the night at the Centropolis, Kansas City, and found the first indications of danger. That right cuff had on its edge a stiff, ragged point, turned out like the tooth of a saw ; on the inside part of this point was glanders virus, and the besmeared, stiff, ragged point had rubbed crosswise on the wrist about ten hours. It had made a one-inch long, red (almost raw) mark like that produced by scratching with an ivory point for vaccination. The friction of this cuff tooth with the virus on, had, in other words, produced an irritation sufficient to cause smarting. I washed the place well and felt easy enough, because I had dealt with glanders before, I may say, weekly during four years, and I feared the disease little. Four days later found me on a Wabash train on my way to Columbia, my home. It was early in the morning, and I had slept fairly. My wrist was paining me some and felt stiff. I looked at it, and found what made me shiver for the first time since the previous winter. At the very point of the irritated tract was growing a little boil, slightly yellowish. I had no cauterization agent, (when opening my caustic case I found it destroyed) and I was twenty miles away from home on a slow train. I became rather fearful, and at once squeezed the vesicle. The matter looked just like that which we find in small farcy buds, and the bottom of ulcer was indurated. I scraped this out with a pocket lance, and as soon as I reached home I dropped a few drops of boiling water in it, and in a few days it was healed. That night I had a little fever, and next day I made arrangements, under advice of two physicians, Profs. Moss and McAlester, to go to Hot Springs, Ark., where I arrived the sixth day after the inoculation.

The fifth day an epitrochlean gland at the right elbow be-

gan to enlarge and feel painful. It gradually grew larger and larger, and then the lymphatics from it became similarly involved. Some days later Dr. Greenway, one of my physicians there, discovered adenites in some glands of the neck. He and Dr. Gaines, who had charge of the case, can testify to this condition. The glands remained so for three weeks, and during all that time the temperature was one or two degrees above normal at times and normal at others. A day or two after the healing of the first bud on the wrist, another one grew, about one quarter of an inch from it, and directly in the primitive irritated line. It became red one day, and next morning it was beginning to fill and it was at once cauterized before virus was sufficient to gather, and indeed I was by that time in no mood to wait for virus to be in sufficient abundance, or for pipettes or vial to gather the infernal poison, if such it was. So I failed to make any inoculative tests or microscopic study to ascertain the nature of the disease. The last ulcer was rebellious. It took six weeks to heal it. It finally coalesced with the mark of the first one and now there is on my wrist but one cicatrix which will probably always show, and there remains a slightly indurated but painless gland at the right elbow. The treatment consisted of iodide of potassium from the fourth day after inoculation to the end of six weeks, and then Fowler's solution of arsenic for a few weeks longer. I began the iodide of potassium at the dose of ten grains three times a day, and in three weeks I was taking *eighty-five grains* (85) three times a day, or 255 grains daily. Besides this I was treated with mercury in local frictions—one dram of the officinal ointment daily, until constitutional effects were apparent. In order to correct the injurious effects of the potassium on the stomach and head, I took with it bi-carbonate of soda for the first, and a few drops of tinct. of bellad. for the last correction. I took hot baths every day, and perspired one to three hours each time. By this means the kidneys did not have to eliminate all the strong medicines and they stood treatment well. After I returned home I continued treatment, gradually lessening the dose, and finally dropped the potassium and used Fowler's

arsenic at three to five drops. I have not used anything for about three weeks, and feel now well and strong. Now was it glanders? I for one, care not what the verdict. I did not feel like awaiting ten or twelve days for development to make a scientific and sure diagnosis. The fact that so many die from the disease is in a large measure because physicians do not know its nature and symptoms, and generally diagnose it only when too late, sometimes even after death. They too usually think that a glandered man *must* die anyway.

Now a word about glanders in animals. Is glanders always incurable in them? I know now a horse living, which three years ago inoculated three mules successively, all of which died with glanders. One guinea pig I myself inoculated also developed glanders clearly and died, and the horse (a stallion) which was valuable, therefore kept in quarantine, has not to-day any discharge from the nose; the ulcers on the septum nasi are healed and have left irregular glossy-white cicatrix; the sub-maxillary glands have reduced and are hard and painless, and the horse looks perfectly healthy. He has been so for over thirteen months. I have in the last year repeatedly inoculated various material—very thin as a rule—from his nose, and failed always to produce any disease in susceptible stock.

Nor is this an isolated case. I have two similar ones on record, and on one of them I made a post mortem examination in 1887. I found many indurated lymphatics but no virus. Found portions of both lungs perfectly solid with a deposit of calcareous appearance—a cretefaction which the edge of the knife could not incise. I have written enough though—much more than I intended to, and I fear that it is rather poor literature, as I write in haste. I hope the readers of the REVIEW will forgive me this. Owing to my late trouble I am greatly behind in my official work, and am compelled to hurry things along.

In conclusion I extend my heartfelt thanks to the many kind friends in the profession who so feelingly expressed their sympathies directly or indirectly to myself, my wife, or my mother and her family during our time of trial.

TRANSVERSE DEVELOPMENT OF THE FŒTUS OF THE MARE.

Paper read before the Illinois State Veterinary Medical Association
By W. L. WILLIAMS, V.S., Bloomington, Ills.

Writers on veterinary obstetrics freely admit the occurrence of a transverse presentation of the fœtus of the mare at time of parturition, but deny, either directly or inferentially, that it is the result of transverse development, and ascribe such mal-presentation to accidental changes in the position of the fœtus during labor.

All experienced veterinarians will admit that this transverse presentation is by no means rare, and there seems to be no good reason for doubting, in general, the assumption that it is attained during labor, the form and position of the generative organs of the mare, the position in which the fœtus is generally found during pregnancy, and the form and size of the fœtus itself, all tending to deny the probability of actual transverse fœtal development.

Recent clinical and post mortem observations have demonstrated, however, that transverse fœtal development may and does occur, these cases being rendered interesting, not only from an anatomo-physiological standpoint, but from the well nigh insurmountable obstacles which such development offers to parturition.

Three cases, occurring in my practice, and which I shall briefly describe, form the basis of my remarks.

The first case, occurring in the spring of 1887, was that of an imported Percheron mare, property of J. S. Hanna, Bloomington, Ill. The animal was large, well developed, roomy, in good general health and condition, had never worked, had reared foals previously without difficulty in parturition, and had attained the usual period of gestation without offering anything unusual. The keeper summoned me to attend the mare, stating that she appeared uneasy and that he believed her to be in labor, and that the case was, in some way, unusual.

Upon examination no labor pains could be observed and

when manual exploration of the vagina was attempted, a marked constriction of vagina at the usual position of the os was mistaken for it, and at this point a live foetus was plainly felt, apparently with all membranes intact.

In the absence of labor pains or rupture of the membranes and as the mare was feeding quietly, I advised non-interference for a time, with close watching.

The mare continued fairly well and quiet for about forty-eight hours when, on being called again, I found foetal envelopes protruding from vulva. On inserting my hand into vagina the foetus was again encountered in the same position as before, but on careful examination it was found that the previously supposed os uteri was merely the constricted portion of the vagina beneath which lay the foetus. By following the protruding foetal envelopes it was easy to find the opening into the uterus, but all semblance to the natural os had vanished.

Far away anteriorly, barely within my reach, the vagina, extremely narrow throughout its entire length, opened abruptly *downwards* and *backwards* into the uterus, while back of this opening and beneath the vagina, lay the body of the foal in a transverse position, readily felt through vaginal and uterine walls, but beyond reach through the os so long as the mare was standing, but when recumbent, the hind legs were barely within reach. After patient and exhaustive work the hind legs were corded at hock, but it seemed impossible to get the limbs into passage until the legs were amputated at hocks. We then had the hocks presenting with ossa calcis pointing upwards, while beneath the vaginal walls could still be felt the main volume of foetus. Firm traction applied to the hind limbs finally brought the foetus away after about five hours assiduous labor.

Examination immediately after the delivery revealed an extensive and fatal rupture of the inferior wall of vagina and that portion of the uterus in contact with it and the mare was destroyed at once.

Being late at night and all hands thoroughly exhausted, no autopsy was attempted and the cause of so curious and vicious a presentation was left unexplained.

The mystery was only deepened a few weeks later when I, in company with our Secretary (Mr. Pease), then a student with me, was called to attend a large, well-formed, high grade French draft mare, property of a Mr. Van Horn of Normal, Ill. She was in excellent condition, had bred successfully before and the usual period of gestation had passed without incident. The foetal membranes protruded, but no well marked labor pains were recognizable. Exploration revealed an exceedingly long, narrow vagina which, at its anterior extremity barely within reach, opened abruptly downwards and backwards, the usual conformation of the os being wanting. On passing the hand into the uterus, while the mare was standing, nothing could be felt posteriorly nor to right or left, while anteriorly could be felt only the perpendicular wall of the uterus which should ordinarily have formed the superior wall. Posteriorly to this opening, and beneath the floor of the vagina the foetus could be plainly felt, and by passing the hand through the uterine opening, drawing the posterior margin of the opening firmly backwards and reaching as far downwards and backwards as possible, a portion of the foetus could be barely touched, but not grasped.

After casting the mare and placing her upon her back, one hock was corded, and with great difficulty brought into the passage. Next a foreleg was secured and amputated, and then after great labor and much valuable assistance from Mr. Pease, the other hind leg was secured, and with strong traction the foetus was brought away after some eight hours exhaustive labor.

The mare lived about twenty-four hours and succumbed, and the owner being dissatisfied, no opportunity for examination was offered.

My third case was that of a grade draft mare, large, well formed, in good condition, had bred before without accident, and had completed the usual term of gestation. The owner resided in Minier, Ill. and I was called in to assist Mr. H. L. Ogden, a local practitioner and fairly successful obstetrist, but who was unable to deliver the mare.

The vagina was found abnormally elongated and con-

stricted and opening abruptly downward and backward at anterior end without any semblance to the usual intra-vaginal-projecting os. The foetus could be plainly felt beneath the vagina and posteriorly to the opening into uterus. The foetus lay with its back resting against the pubis of the mare, and by passing the hand through the opening into uterus, then downwards and backwards the elbow of one fore leg could be touched with difficulty.

After long and arduous effort, this fore leg was secured and brought into the passage. All efforts to secure other limbs or parts of foetus either by raising abdomen by means of a sheet passed underneath and drawn up by means of pulleys or by casting mare upon her back, proved unavailing and the mare was destroyed.

An autopsy was held at once, showing a large, well-formed and matured foetus lying on the right side with dorsum against the pubis of mare, the head in right uterine cornu, the hind legs in left cornu, the body occupying a thoroughly transverse position. The body of the foetus lay positively to the uterine opening, one fore leg flexed at knee, the other (which we had secured) being drawn backwards over the neck of the foetus into the vagina.

The two cornua, owing to peculiar development of foetus, instead of being practically parallel and corresponding in their longer axis, to that of the mare, were disposed opposite to each other in a transverse position. The vagina was much elongated and narrow, and its opening into uterus bore no resemblance to the ordinary os. The opening was abrupt downwards, the superior wall of vagina suddenly losing itself by turning abruptly downwards, where it was continuous with the perpendicular anterior uterine wall. The inferior wall of vagina terminated abruptly in a thin margin; what had previously been the inferior wall of uterus, being turned upwards and backwards against vagina, thus forming the *superior* uterine wall.

From the position of the foetus in the uterus, and the equal development of the uterine cornua, this case must be considered a *bona fide* transverse or bi-cornual foetal develop-

ment, and judging from analogy there can be but little doubt that the other two cases were identical with this one.

The causes which lead to such transverse development are not clearly understood. Downward and backward uterine displacement occurred in all my cases, being certainly not primary, but secondary in character, due to the unusual mode or direction of foetal development. Fleming mentions uterine displacements, but in those cases the displacement is described as occurring directly downwards, and the foetus presenting in any of the ordinary positions. In the cases recorded above, bearing in mind the usual form and position of the uterus and its cornua and the foetus, it is impossible to imagine how the uterus could be so displaced, except through some fundamentally vicious position of the foetus during its development. It would seem, therefore, that this anomaly in gestation is due to the impregnated ovum developing transversely for a time in the body of the uterus, and later extending more or less equally by the extremities into both cornua.

Franck and other observers tell us that the foetus in the mare, during the earlier stages of gestation, develop mainly in one cornu, bearing the gravid cornu downwards toward the inferior abdominal walls, and with this bearing downward and forward, the vagina suffers consequent elongation and narrowing. Later on in pregnancy, in this normal position, the foetus extends and develops more and more into the body of the uterus, the longer axis of mare and foetus corresponding, the anterior extremity of foetus gradually approaches the os, relieving the previous tension upon the vagina, and slowly pushing the os towards the vulva, permits the vagina to dilate laterally.

When, however, the development takes place in the body of the uterus, with the long axis of the foetus transverse to that of the mare, we can readily understand that in the earlier stage of foetal life, the same change in position of the genital organs must occur, except that the foetus would necessarily bear the uterus down nearer to the os pubis than though the development occurred in one cornu, and the transverse position of the foetus necessitating extraordinary

transverse development of the body of the uterus, practically prohibits any linear uterine development or extension so that the actual forward displacement must take place at the expense of the vagina. But by what means does the fetus attain a position posteriorly to the os uteri and beneath the floor of vagina?

The most tenable theory to me is, that in the earlier stages of this transverse development, the fetus lies with its back downwards towards the inferior abdominal walls, and the abdomen upwards toward the spine of the mare, which is the normal position of the fetus at this stage when normally situated in one of the cornua.

With the fetus developing in the body of uterus, the two cornua, not bearing their normal weight, would naturally assume a practically perpendicular position. When, however, the hind and fore extremities attain considerable size and weight and push their way up into the cornua, the equilibrium of the fetus is soon disturbed and the newly attained weight bears the cornua downwards, increasing the tension upon the vagina and the superior walls of the uterus, the body of the fetus partially turning on its axis, decreasing the tension on the inferior uterine wall, and by this turning, displacing and pushing it upwards and backwards, against the inferior vaginal wall, the back of the fetus resting against the pubis of the mare.

The diagnosis of this anomaly should prove comparatively easy. We note the abnormally long and narrow vagina; the absence of the usual projection of the os uteri into the vagina, and in its stead an abrupt opening of variable size, downwards and backwards at the extreme anterior end of the vagina; the fetus lying more or less transversely, inferiorly to the vagina and posteriorly to the os, where it can readily be felt through the vaginal and uterine walls, and generally, the inability on the part of the mare to make any true expulsive effort.

The prognosis must be uniformly grave, some cases offering apparently insurmountable obstacles to delivery, while in those cases, where after herculean labor, the obstetrician succeeds in removing the fetus, he finds that a fatal rupture has

been unavoidably caused, or, escaping this danger, the animal most likely succumbs to exhaustion or metro-peritonitis, due to the protracted labor and manipulation.

The indications are, to place the animal on her back, then secure any extremities which can be reached and bring them into the passages.

If the hind legs are secured, it may be found impossible to get the feet into the passage, in which case the legs should be amputated at the lower part of the hock joint, leaving the *os calcis* uninjured.

If all the anterior extremities can be secured and brought into vagina, and hind legs are not in the way, embryotomy will probably prove unnecessary. If two fore legs only, or one leg and head can be brought into passage, remove one leg and shoulder subcutaneously, take out one or two of the exposed ribs, eviscerate and then try to secure missing member. If the head cannot be reached after the removal of shoulder and evisceration, the foetus can be withdrawn, with head and neck doubled back.

If both hind and fore legs can be brought into vagina, amputate the fore ones, and by traction on hind ones, convert it into a posterior presentation.

In removing the foetus, after securing the extremities and making the above suggested preparations, great care and judgment should be used in the amount and direction of traction employed, and the mare should, I think, be kept upon her back during this part of the work, so as to throw the foetus and uterus as nearly as may be, in a line with the vagina, thus facilitating the attainment of a favorable position by the foetus and lessening the danger of a fatal rupture by decreasing the strain on the inferior vaginal and superior uterine walls, which lie in contact; the foetus, from its position, having first to pass forwards before it can enter the vaginal canal. If due care is not used at this point, it can readily be seen that if the body of the foetus still rests beneath the vagina, and the members of one extremity are in the passage, severe and hurried traction can scarcely fail to lacerate or rupture the intervening inferior vaginal and superior uterine walls. The amount of trac-

tion required is usually great, the mal-position of foetus and uterus preventing effectual expulsive force on the part of the mare.

MODERN FEEDING OF PIGS,
AND ITS INFLUENCE UPON THE FORMATION OF THE SKULL
AND DENTITION.*

BY OLOF SCHWARTZKOPFF, V.M.D.

During the past few years many objections have been raised, on the part of our practical breeders, to the correctness of the older rules for recognizing the age of our domestic animals. Several cases of an extraordinarily early development of dentition have been observed in fat stock shows, and other exhibitions, and it has been alleged that modern feeding, with the tendency to produce early maturity, results also in an earlier shedding of the teeth. Not only in the United States have these doubts been heard, but also in England and Germany. In 1882 Prof. G. T. Brown published in the journal of the Royal Agricultural Society, of England, an article in which he comes to the conclusion that, as a general thing, the views of the breeders cannot be relied upon, and that the recognition of the age from the teeth is still the best and surest. In June, 1886, the executive committee of the fat stock show at Berlin preferred similar complaints, and requested the Minister of Agriculture to introduce new experiments at the veterinary schools and agricultural experiment stations in Germany, to ascertain whether the signs of age from dentition, sexual development and growth of horns, can appear at an earlier time in our precocious breeds, than hitherto believed. Accordingly, Prof. A. Nehring, of Berlin, published in the "Landwirtschaftliche Jahrbucher, of 1888," a series of new dentition tables for pigs, as a result of his studies and investigations upon a collection of one hundred and thirty-one skulls of different kinds of pigs, at the museum of the Royal Agricultural School at Berlin.

* Reprint from Bulletin Agricultural Experiment Station, University of Minnesota.

Having seen and examined parts of this collection, I will undertake to demonstrate, with the guide of the above mentioned tables, together with my own experience and observation while practicing in breeding establishments, that our practical men have been quite right in many cases, and that the doubts to which reference has been made are not without foundation.

Before entering into the variations observed, I will briefly review what is accepted concerning the dentition of the pig.

This animal has two sets of teeth, a first called the temporary or milk teeth, which after a certain term of general development of the animal, are replaced by a second set, called the permanent teeth. In both the temporary and permanent dentition we distinguish three kinds of teeth, according to their form and purpose; these are called—first, the incisors, placed in the anterior portion of the jaw for taking up the food; second, the tusks or canine teeth, which are looked upon merely as a natural weapon; and third, the grinding teeth, or molars, in the posterior part of the jaw, for the mastication of food. The permanent molars are divided into premolars and molars; the rudimentary tooth, commonly known as wolf's tooth, being counted with premolars. The wolf's tooth and the three permanent molars come into place without being preceded by milk teeth.

Because of certain difficulties in describing the number of these different teeth, their disposition in the jaw and mode of succession, it has become a practical usage to represent these particulars in a dental formula; such is a combination of letters and figures being very convenient for reading and writing. The following formula we will adopt for our purpose:

I. TEMPORARY OR MILK DENTITION, COMPLETE.

6 upper.	}	incisors,	Formula of Temporary Dentition for one side of the Jaw.
6 lower.		i.	
2 upper.	}	tusks or	INCIOSORS.
2 lower.		canine teeth,	
2 upper.	}	c.	TUSKS.
2 lower.			
6 upper.	}	molars,	MOLARS.
6 lower.		m.	
		14 on each side.	

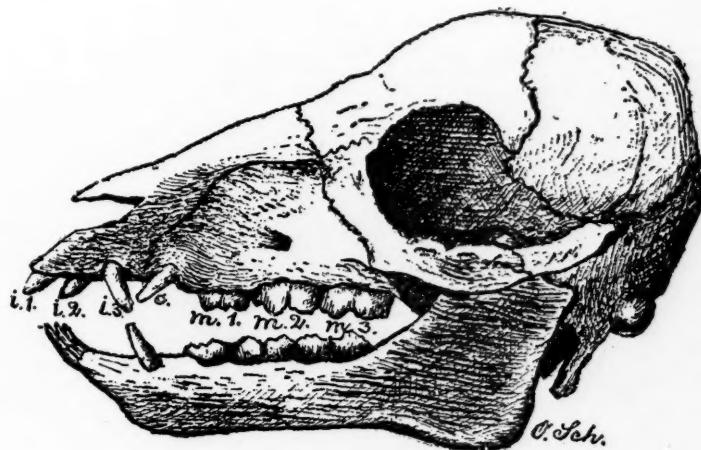


Fig. 1.

Skull of a three months old pig, with full milk dentition. (Original.)

II. PERMANENT DENTITION, COMPLETE.

6 upper.	Incisors,	Formula for Permanent Dentition for one side of the Jaw.					
6 lower.	I.						
2 upper.	(Tusks,)						
2 lower.	Canine.						
2 lower.	C.						
P 1, Wolf's tooth, if present.		INCISORS.	TUSKS.	PREMOLARS,			
6 upper.	Premolars,	I 1, I 2, I 3,	C.	P 1, P 2, P 3, P 4,			
6 lower.	P.	I 1, I 2, I 3,	C.	P 1, P 2, P 3, P 4,			
6 upper.	Molars,	22 on each side.					
6 lower.	M.	44 on both sides.					
MOLARS.							
M 1, M 2, M 3,							
M 1, M 2, M 3,							

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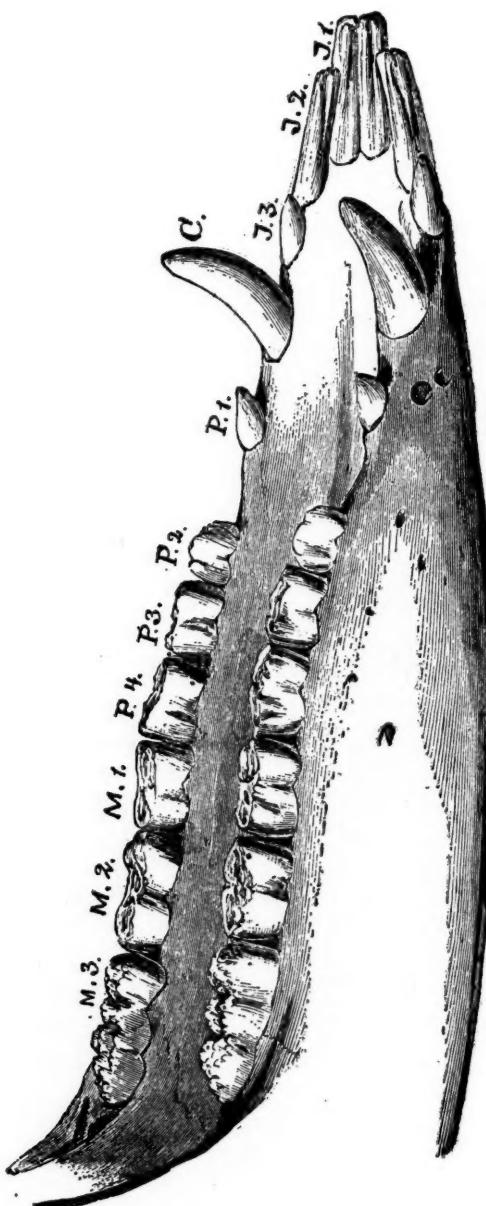


Fig. II.
Lower jaw, showing permanent dentition. (After Rhode).

Making use of these dental formulas, I will proceed to explain the development of the milk and the permanent den-

tition, comparing both the old observations and the new. This method will prove that there is a remarkable difference in the time occupied by the teeth in cutting their way through the gum and appearing on its surface, while the mode of succession remains unchanged. But it must be remembered that the dentition tables, still referred to in modern books for the practical pig breeder, are based upon observations made in times when the common pig was raised, or, perhaps, a breed more or less improved by English stock, and fed in the old fashioned style. Variations into early maturity were then described as abnormal; but as soon as the pure breeding of the favorites of our day commenced, Berkshire, Poland China, *et al.*, and we applied to them scientific feeding, we forced the animals into entirely new and artificial conditions, revealing the hitherto unknown physiological laws of early maturity.

The young pig comes into the world with eight teeth, *I* 3 and *C*, that is the corner incisors next to the tusk, and the tusk itself. These teeth look very much alike, and evidently have the purpose of assisting the tongue in sucking.

Between 4 and 14 days appear two milk molars, *M* 2 upper and *M* 3 lower jaw. From 2 to 5 weeks break through *M* 2 lower and *M* 3 upper jaw, and at about the same time *I* 1 upper and *I* 1 lower jaw. Between five weeks and three months appear *I* 3 and *I* 2 lower jaw, followed shortly after by *I* 2 upper. With this tooth the milk dentition is finished--the normal time being three months. The longer time mentioned in each case is the time at which the various teeth appear in the primitive hog, and the shorter time is that at which these teeth may appear in our improved hogs.

The milk dentition is now resting for a time, seemingly to prepare for the growth of the permanent teeth. Between 2 and 6 months the first permanent molar *M* 1 will appear, and together with it the wolf's tooth. The other teeth are replaced in the order in which they succeeded in the milk dentition. Thus we see *I* 3 and *C*, at $7\frac{1}{2}$ to 10 months, followed shortly by *M* 2 upper and lower jaw. In about 12 months, *I* 1 lower will appear, while *I* 1 upper jaw sometimes comes as late as 15 months. After changing the premolars, *I* 1 and *M* 3 appear in from 11 to 22 months. Between 16 and

17 months are replaced *I* 2 upper and lower jaw. At almost the same time appears the last molar, *M* 3, in upper and lower jaw. Now we have a fully developed permanent dentition, which is illustrated in Figure II.

For the practical use of the swine-breeder, I will summarize what has been discussed above in the following

TABULAR VIEW OF THE DENTITION OF THE PIG.

	TEETH.	Precocious Pigs.	Normal time of Appearance.	Primitive Pigs.
Milk Dentition.	<i>i</i> 3, and <i>c</i>	Present at Birth.
	<i>i</i> 1.....	2 weeks.	3-4 weeks.	5 weeks.
	<i>i</i> 2, } upper jaw	8 weeks.	12 weeks.	16 weeks.
	<i>i</i> 2, } lower jaw.....	5 weeks.	8 weeks.	12 weeks.
	<i>m</i> 1, both	5 weeks.	7 weeks.	9 weeks.
	<i>m</i> 2, } upper jaw	4 days.	8 days.	14 days.
	<i>m</i> 2, } lower jaw.....	2 weeks.	3-4 weeks.	5 weeks.
Permanent Dentition.	<i>m</i> 3, } upper jaw	2 weeks.	3-4 weeks.	5 weeks.
	<i>m</i> 3, } lower jaw.....	4 days.	8 days.	14 days.
	<i>I</i> 1.....	11 months.	12 months.	14 months.
	<i>I</i> 2.....	16 months.	18 months.	21 months.
	<i>I</i> 3.....	7 $\frac{1}{2}$ to 8 mos.	9 months.	10 months.
	<i>C</i>	3 $\frac{1}{2}$ months.	9 months.	10 months.
	<i>P</i> 1.....	2 to 3 mos.	5 months.	6 months.
	<i>P</i> 2.....	13 months.	14 to 15 mos.	16 months.
	<i>P</i> 3.....	12 months.	13 to 14 mos.	15 months.
	<i>P</i> 4.....	12 months.	13 to 14 mos.	15 months.
	<i>M</i> 1.....	2 months.	5 months.	6 months.
	<i>M</i> 2.....	7 to 8 mos.	9 to 10 mos.	12 to 14 mos.
	<i>M</i> 3.....	17 months.	18 to 19 mos.	21 to 22 mos.

7. The question now arises as to what may be regarded as the cause of this early dentition in modern pigs. We know that our present method of feeding causes a rapid development of the whole body, including, of course, the head. As the teeth could not possibly grow without a corresponding growth of the jaws that produce them, we must conclude that the development of the skull is the primary cause or driving force in their development. Unconsciously the modern feeder has produced here some highly interesting facts, instructive to natural science at large. Hitherto zoologists have been of the opinion that the form of skull of a fixed species is unchangeable from generation to generation, we may say for thousands of years. This is correct as long as we think of individuals raised in the freedom of nature and under natural and similar circumstances. But domestication, with its forced feeding and breeding for various demands, has brought about

unexpected changes in many respects, and it is now evident that the form of skull does not rest merely upon heredity. Only a predisposition to a certain form of skull is transferable from parents to their offspring, but whether exactly the same form will be transmitted depends to a greater extent upon the nutrition, and but little less upon the employment of the muscles of the head and neck. It is not only important that the nourishment be abundant and well selected, but it is also necessary that the individual be in a healthy condition, and his digestive apparatus in such working order as to be able to utilize the offered food equally well. This is plainly seen by comparing skulls from animals which were healthy and growing vigorously, with those which received the same advantages of nutrition, but were suffering with a chronic disease. Continued weakness, caused either by disease or insufficient food, produces a long slender skull, while the skull from a strong pig shows a remarkable expansion in its latitude and altitude. The following reproductions, taken from originals in the agricultural museum at Berlin, will illustrate this point:

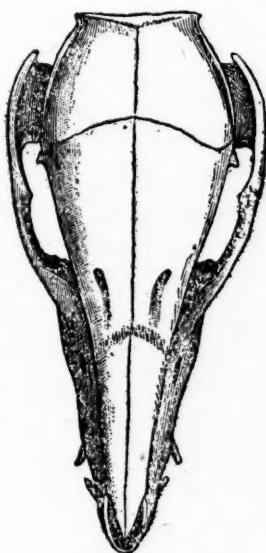


Fig. III.
Skull of a three months old pig, which died from tuberculosis, $\frac{1}{2}$ natural size.
(After Nehring).

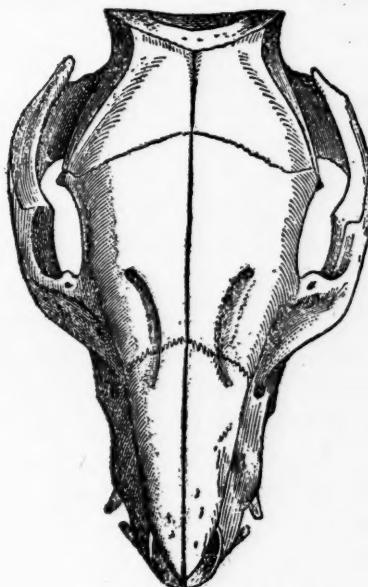


Fig. IV.
Skull of a two months old healthy and well fed pig, $\frac{1}{2}$ natural size.
(After Nehring).

Besides the nutrition influence, a strong or weak muscular action plays an important part in the production of form. The pulling and pressure of muscles extensively used for certain purposes, especially those of the head and neck, will give the head a characteristic shape. Pigs which are prevented from rooting will acquire a short, high and rounded head, while those which are forced to root to secure a portion of their food will develop a long and slender form of head. If we force both experiments to the greatest degree possible, we shall produce those extremes which distinguish the wild pig from our improved races. That this is true is proven by the fact that when our domestic hogs are returned to absolute liberty, it will require but a few generations to reproduce the original skull of the wild pig. And, *vice versa*, we have called into existence from the primitive hog all those different representative types of our day, by careful and continued selection, gradual assortment, and particular attention to the desired qualities of form, size, etc. The striking difference between the skull of a primitive hog and a modern one is seen in the following illustrations :

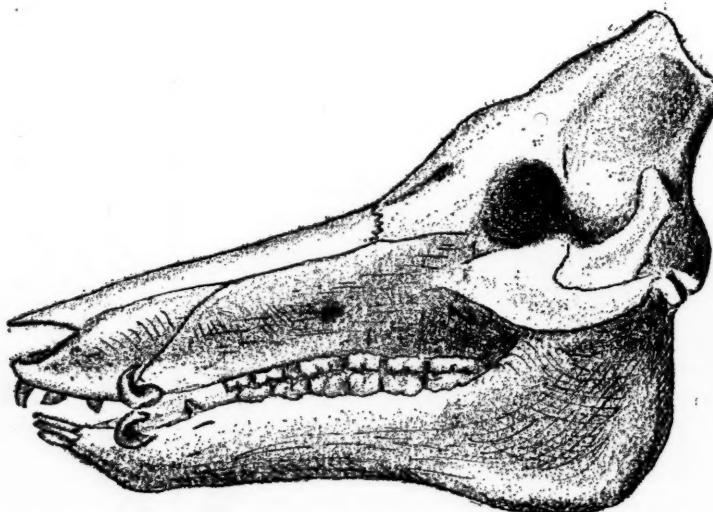


Fig. V.

Skull of a full grown primitive Texas Boar.
(Original).

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Fig. VI.

Skull of a full grown sow of the Small Yorkshire breed. (After Rhode).

To express this idea in figures, see following table :

HEAD.	Basilar Length.	Zygomatic Breadth.	Greatest Height.
Fig. V.....	13 $\frac{1}{4}$ inches.	5 $\frac{1}{2}$ inches.	5 $\frac{3}{4}$ inches.
Head similar to Fig. VI. In possession of writer.	9 $\frac{3}{4}$ inches.	6 $\frac{1}{4}$ inches.	6 $\frac{1}{2}$ inches.

The pig has, perhaps, the most elastic and changeable organization of any of our domestic animals. It also has the advantage of being able to digest all kinds of food as an omnivorous animal, and last, though not least, it multiplies more rapidly than any domestic animal, even the sheep. Therefore it has been at all times regarded, and properly, too, as the animal par excellence for experiments in breeding, and the pig is the best example of what men have accomplished in the production of animals.

Drawing, now, the conclusions from the above examinations, I shall summarize them in the following theses :

- I. The order of succession of the teeth in our precocious pigs remains the same as in the primitive hog.
- II. The times when the teeth appear are variable, according to the race, feeding and health. The same breeds, raised under the same conditions, will show the same appearance.
- III. The form of the skull depends upon nutrition, health and more or less employment of certain muscles of the head and neck.

THE DIARRHŒAS OR "SCOURS" OF NURSLINGS: COLTS, CALVES AND LAMBS.

By G. ARCHIE STOCKWELL, M.D., F.Z.S., Member of New Sydenham Society (London).

In adult domestic creatures, simple scouring being as a rule self-limited, is usually a matter of little moment, and non-productive of harm; the reverse, however, holds true of sucklings, more especially among ovines. The losses to breeders and agriculturists from this cause alone, in a single season, in some years assume frightful proportions, having on more than one occasion in the United States risen to forty per cent for lambs, and fifteen to twenty per cent for calves and colts. Further, it is computed that of the death rate of sucklings, seventy-five per cent. is attributable directly or indirectly to diarrhoea. Scours, too, appear to be upon the increase rather than otherwise, the cause being four-fold:

First.—Because of improvement in breeds and grades, including too close in-breeding, thereby engrafting more sensitive and acute nervous organizations, and fostering and perpetuating race weaknesses.—The most serious objection to in-breeding is the tendency to magnify the evil at the expense of the good in any class or race.

Second.—Owing to the lack of familiarity with the laws of hygiene, and knowledge of the physiological phenomena governing digestion, nutrition, etc.

Third.—Ignorance of predisposing causes, and the pathological changes induced; and

Fourth.—Imperfect understanding of therapeutics due to the second and third of these propositions, and of the chemico-physiological changes induced by both the disease and the remedies employed, with consequent improper care and treatment.

WHAT IS "SCOURING"?

Diarrhoea, from a general standpoint, may be considered as simple, inflammatory or acute, and organic: *Simple*, when the alvine evacuations are frequent, loose or liquid, without admixture of sanguineous products, and not dependent upon, or aggravated by, co-existent inflammation. *Inflammatory* or *Acute*, when due to excessive irritation leading to diffused inflammation accompanied by serous or sanguinolent exudation, threatening extension and exhaustion. *Organic*, when dependent upon morbid conditions of the *primæ viæ* and accompanied by manifest structural changes. This classification, which is somewhat arbitrary, is made as a matter of simplicity and convenience.

The diarrhoeas of which I propose to treat are either simple or acute, and depend upon changes occurring in the economy of the stomach and small intestine; for in nursing creatures the larger bowel is never involved save perhaps through extension, being chiefly a convenience serving little purpose save as an escape for effete matters. Further, fluxes dependent upon changes in the colon and cœcum are rarely of local significance, but referable to structural degeneration and changes in other portions of the economy, and super-imposed by inflammatory exudations of the lesser bowels—as in tuberculosis mesenterica, for instance.

Diarrhoea may arise from: *First.*—Indigestion and non-assimilation, proceeding later to exhaustion and debility. *Second.*—*a*—Absorption of poisonous and unhealthy gases (miasm), improper stabling, etc. *b*—Foul water supply furnished the parent. *c*—Microbes or ptomaines introduced from without, or spontaneously developed within the economy

of the animal itself through physiologico-chemical changes. *Third*.—Exposure to cold, damp, excessive heat. *Fourth*.—Mental agitation and reflex irritation. *Fifth*.—Tubercular disease involving the mesentery or other viscera. *Sixth*.—Excessive secretion of bile, or suppression of same from any cause.

Of these, only the *first*, *third* and *last* demand attention in connection with sucklings, since the others, occurring, are for the most part relative and symptomatic. The second and third also procure the first, hence for all practical purposes may be considered with the latter.

INDIGESTION.

This may be a product of either under-feeding or over-feeding, constituting improper food supply, and consequently, from a physiological standpoint, starvation. Continued indigestion in sucklings is especially apt to induce relaxation of the mucous coat of the intestines, and thus a diarrhoea that begins as a mere mucous discharge may speedily become serous, colliquative, and terminal.

FOOD.

The milk of the cow is approximately represented by 86.56 parts of water, and 13.44 of solids, the latter embracing 4.58 of casein and albumen, 4.03 of butter, 4.60 of sugar, and 0.73 of inorganic salts—sodium, potassium, magnesium, calcium, phosphorus, sulphur, iron and silica.

That of the mare has a larger proportion of solids, viz: 17.16 per cent., with an excess of butter (total 6.87) of 2.84, but considerably less casein and albumen, the total of both being but 1.64. Sugar and salts are in excess by 3.32 per cent., being in all 8.65 per cent.

In the ewe the lacteal secretion more nearly approaches that of the mare, there being but 0.47 of solids. This represents, practically, the same proportion of butter, and half the amount of sugar and salts, while that of casein and albumen (5.73) is in excess.

In the foregoing we find in the proportion of butter, casein, and albumen, physiological reasons for the more frequent

appearance of scours in lambs than calves, and in the latter than colts, as the sequel of interrupted or abnormal digestion. There are variations in the proportionate constituents of milk in the same grade and class of animals, however, and also, at times, in the same individual animal ; and it is a well known fact that all exhibit a greater proportion of casein, butter, and albumen at night than in the morning. Again, the milk supply varies also with the condition, food supply, and surroundings of the mother, consequently it is not, or should not be, a matter of indifference to the breeder how his animals are fed, especially when they have nurslings at their sides. Brewers' grains, lush grass, refuse slops, and like foods that are employed because of their supposed ability to increase the supply of milk, and also on the score of frugality, are apt to prove the reverse of economical so far as the rearing of young animals is concerned ; to the suckling it is virtually "offering a stone" instead of giving "bread." It should be remembered, moreover, that while the nutritive apparatus in these immature creatures excels in absorption, it is also deficient in digestion as compared with adults.

DIGESTION.

Since sucklings do not masticate nor ruminate, and exhibit but slight evidences of salivary secretion during feeding, the diastatic effect is not instantaneous, but, on the contrary, the flow of saliva is secondary to deglutition. This is the reason why immature creatures so frequently exhibit the phenomenon, after feeding, that in children is denominated *druling*.

Sucklings are scarcely at all dependent upon saliva to further the act of digestion, and those of ruminants make little demand upon the first, second and third stomachs. As soon as the rumen is excited to action by the act of swallowing, the food is quickly passed to the abomasum, when digestion differs in no essential from that of other herbivoræ, or even carnivoræ and omnivoræ.

Arrived at the stomach (abomasum in ruminants) the milk is thoroughly mixed with the gastric secretion, and by the action of the rennet (milk curdling ferment) the casein is co-

agulated, and the curd containing the fat globules floats in a clear fluid (the whey), which holds in solution the salts, sugar and albumen. As digestion progresses, the casein is turned into peptone, the fat is set free, and, being partially emulsified, gives a milky or turbid color to the whey. The stomach of the nursing contributes more to digestion proportionately than that of the adult, since, when the food is of proper quality, peptones are rarely discovered in the intestines, or the remnants thereof in the pylorus; presumably, also, nursing stomachs may also absorb nourishment directly, in some degree, since the cardiac and pyloric portions, for a brief period after birth, can contribute but very little to digestion, the peptic glands loosely resembling muciparous follicles.

Here an important consideration in connection with scouring presents itself, viz., the quantity of water contained in the food, which quantity in herbivorous creatures, as before noted, should average between eighty and ninety per cent. of the total milk ingested. Water is in especial demand for the formation of hydrochloric and lactic acid, and also pepsin, and is essential to the action of the latter in forming peptones; the effect of the gastric fluids upon the casein also requires a large quantity of water, consequently any circumstance that tends to concentrate the food by reduction of fluids, tends to interrupt digestion—the caseous matter, instead of parting with its oily constituents, passes on into the duodenum where this process is impossible, provoking irritation, abnormal stimulation, determination of circulation, ending in flux.* Fat (butter), to be sure, is not digested in the stomach, but it is separated and prepared for the changes that take place when it encounters the bile and pancreatic products. Again, as

*Apropos of this, permit me to call attention to an experience of Dr. David Little, published in *The Transactions of the Medical Society of the State of New York* in 1884.

In an orphan asylum in Rochester where every previous summer had witnessed a number of deaths from diarrhoeal disease, he directed that infants should be fed at three-hour intervals during the day and have nothing at night. Water was allowed freely at all times.

This season passed without a fatal case of diarrhoeal disease! The moral is plain.

these last are but moderately efficient in sucklings, food too rich in fats, and that have not undergone proper changes in the stomach, prove too onerous for duodenal digestion, and secure the same pernicious effect. Indeed, it is a general observation of physiologists that derangements of nursinghood more frequently arise from lack of sufficient water in the stomach (and consequently lack of pepsin, and hydrochloric and lactic acids) than from any other cause; and lactic acid derived from milk sugar is the essential requirement for the first stage of digestion.

When done with the food, the stomach expels into the duodenum the residue, viz., all starch that has not been converted into sugar, any cellulose that may be present, all parapeptides and dyspeptides resulting from proteinates, all fats, and some proportion, perhaps, of salts. These are now brought in contact with, first the biliary secretion, and second, the secretion of the pancreas. The remainder of the starch is thus converted into sugar, the fat is further emulsified that it may be absorbed by the intestinal villi, and the remaining albumen changed into soluble material. The two latter effects are never observed on zoötomic examination of sucklings that have succumbed to diarrhoea, hence it is evident that this lack of digestion is a prime factor in such conditions, and further, that the pancreas in young animals—in whom it is to a certain extent rudimentary—cannot be depended upon for the performance of its wonted function during an attack of scours.

The pancreas is functional and active only when the intestinal fluids are alkaline, and this alkaline reaction depends upon the presence of sodium phosphide; consequently, when through lack of soda the fluid becomes acid, the result is a diarrhoea that interferes with, or altogether arrests, the processes that tend to the formation of blood, bone and muscle, and general exhaustion follows more or less rapidly in accordance with the previous condition of the creature. Lambs naturally succumb quicker under such circumstances than calves and colts, owing to finer nervous organization, and consequent lack of nerve tone.

It is generally believed that the fat acids saponify with the alkalies of the duodenum. In such case, when the alkalies are sufficiently abundant to decompose fat, but not sufficient to the formation of soap, the result must needs be an excess of fatty acid, and when this occurs the alkaline intestinal fluids, especially the biliary secretion so essential to duodenal digestion, are neutralized; thus not only is the effect of the bile present destroyed, but in consequence thereof less bile is secreted. The biliary products are most essential to the absorption of chyle, but are not produced in sufficient quantities when the food is but incompletely transformed. Again, since the faeces almost always exhibit slight acid reaction, it is to be supposed that this is in consequence of the completion of the digestive act, and therefore not abnormal; but this acidity is increased or decreased from normal with the greatest facility in young creatures.

All fat is not absorbed in the act of digestion, since a portion leaves the intestines in the form of soap, another portion as free fat acid, and still another comparatively unchanged. In diarrhoea there is a large amount of faeces, the detritus of which is principally casein and fat, with more or less intestinal epithelium. In health, on the contrary, casein is never present, hence its detection is *prima facie* evidence of over- (*i. e.* too rich) feeding, or of interference with the digestive act by reason of an excess of free acid in the stomach. An important application of this fact is found in the succeeding paragraphs.

"As it is true that fat is not completely absorbed even under the most normal circumstances; as free fat acids are easily formed and accumulated; as they are formed in moderate quantities even in healthy nurslings; as it is known that a surplus is very apt to derange digestion and assimilation, and that it even prevents the normal secretion of either of the digestive fluids, gastric or duodenal; as there is usually a superabundance of fat in the normal food of sucklings, the conclusion is that the greatest care should be taken to ensure proper food supply through the parent." (Jacobi.)

It is a simple matter to secure an excess of fat, but quite a different one, on the contrary, to secure too little, or to keep

within bounds. And for this reason, a favorite milch cow, prolific in cream and butter, may prove the worst possible brood animal, and unable to rear healthy, sturdy offspring. In such a case benefit is had by removing the calf to another cow, one that fulfills the required conditions, or, better yet, hand-feeding with diluted and peptonized milk; as morning's milk is much less abundant in casein than that of evening, restriction to the former often answers the required purpose.

ÆTILOGY.

Healthy sucklings possess a tendency to looseness of the bowels, their evacuations being normally fluid or semi-liquid. This obtains for two reasons—the condition of the intestinal tract, and the nature of the food. Again, peristalsis is extremely active in the young; the blood vessels and lymphatics are most permeable; the transformation of surface cells rapid; the inhibitory centers deficient in development; and, finally, there is greater reflex irritability.

All these, taken in connection with the fact that the action of the sphincter ani is far from being firm or powerful—that faeces are not retained in the rectum or colon sufficiently long to permit of any absorption of fluid constituents—tend to explain the predisposition to scours in the young. Atop of this concatenation, we may have the quantity of digestive fluids limited, or the supply of food ingested in excess, resulting in abnormal digestion, provoking fermentation, putrefaction, and irritation; the putrefaction of albuminoids develops an excess of ptomaines that, if absorbed, secure blood-poisoning, and nervous reflex irritation, irrespective of direct instant action upon the intestines. Bouchard declares that enough ptomaines are produced in twenty-four hours in the healthy animal, by the act of digestion, to procure its death, providing excretion was stopped and all absorbed; and T. Lauder Brunton asserts: "The alkaloids which are obtained from the decomposition of albumen are one of the chief sources of diarrhœas." The scours resultant upon "taking cold" are due merely to the locking up of normal secretions, interfering with digestion to the production of ptomaines; and the same

occurs from excessive heat, impure air and water supply, etc. All this is especially true of lambs, owing to their weaker nervous organization and consequent lack of tone, for no animals are more sensitive to sudden changes of temperature, the effects of low, damp, wet pastures, and overcrowding and improper shelter. Neither are the surroundings of the parent without influence; in which category may be enumerated exposure, overwork, improper shelter and food, and all causes that tend to modify or deteriorate the lacteal supply, or to divert nourishment from the lacteal apparatus to supply the general demands of the economy of the mother. This last is more provocative of scours in colts than is generally surmised, though over-heating of cows has long been held a prime factor in procuring the same malady in calves. True, most breeders and agriculturists assume a working mare ensures a more healthy foal, but this is true only within limits, and in so far as labor tends to restrain the excessive production of casein and fat in the milk. Too scanty lacteal supply, or milk that is greatly impoverished, forces the suckling to seek other foods, for the digestion of which its stomach and duodenum are ill-fitted; profuse supply also tends to the same end if devoid of the proper amount of water.

PATHOLOGY.

Simple diarrhœas as a rule are not febrile maladies *per se*, (though by neglect they may become so) but rather partake of the nature of symptoms and warnings; they are efforts of Nature to relieve the economy of some evil in the way of excess, or poisonous or irritating material, and when such obtain, if not so profuse as to threaten exhaustion, are apt to be self-limited and beneficial. In such there are no pathological changes, the flux being of the crapulose variety, characterized by discharges every way normal save as to fluidity, requiring little or no treatment other than restriction and dilution of food.

Acute diarrhœas are alimentary, and may be also infectious. If of the former class, the dejections are yellow in color, small in amount, and contain much undigested matter—casein, fat

and fatty acids. This is the chylous diarrhœa of some authors, the sequel of gastric and duodenal disturbance and non-assimilation. Improperly cared for, especially in unhygienic surroundings, it is apt to progress into a dysenteric form, especially in young ovines, and also become infectious and perhaps epidemic. In the primary infectious form, the passages are of lighter yellow, even approaching a lemon or whitish hue, more numerous, are either acid or neutral in reaction, often fœtid, and contain large numbers of microbes, which may play an important part in the pathogeny of the trouble. Such scours readily assert themselves during weaning, or in creatures that are improperly and continuously hand-fed.

Another form is the diarrhœa lienteria, which may be—and often is—indicative of organic disease, probably adynamic or hereditary in origin; it is one of the characteristics of mesenteric tuberculosis, purpura, aphthæ neonatorum, etc., and is common among the offspring of creatures that are too closely inbred—an act calculated to perpetuate and intensify race weaknesses. The passages are white at first, and of some consistence, but later occasionally and temporarily stained with bile, and extremely liquid. When not due to organic causes, the trouble lies in an alteration of the secretion of the pancreas, and perhaps that of the liver as well: the food coagulated in the stomach is not transformed into peptones by the pancreas, and passes in an undigested state.

Green and bilious diarrhœas should be classed among alimentary, and are of more frequent appearance in colts than in either calves or lambs: they are attended with increased biliary secretion, and loose copious stools of bright yellow, or yellow-green, of decided acid reaction. Commonly arising from high temperature of surroundings and impure atmosphere, they usually appear during the first month succeeding birth, are not characterized by serous digestive derangement, and are especially prone to be self-limited, and consequently harmless.

Reflex diarrhœas also are observable, dependent upon taking cold, dentition, etc., in which the passages may be simply mucous, but sometimes assume a serous nature; are

yellow, and do not necessarily contain particles of undigested food.

Epizoötic scours are common, and in general outline resemble somewhat both the bilious and lienteria, lacking, however, the flow of bile peculiar to the former: frequently they are almost, or quite, dysenteric in character, are usually accompanied by muco-enteritis with intense congestion of the mucous-follicles, and general inflamed condition of duodenum and stomach; the latter on zootonic examination invariably contains curded milk. The passages are white, or white flecked with green, slightly acid; at first mucous mixed with intestinal epithelium, they speedily become serous, streaked with blood perhaps, or even decidedly sanguineous, and arise from poisoning due to specific bacilli developed epizootically through damp, sour pastures, or the phenomena incidental to taking cold from over-crowding and impure air.

It is by no means rare to find such scours complicated with other ailments such as pleuro-pneumonia, congestion of lungs, etc. They are, moreover, infectious, often truly epidemic, and generally rapidly fatal, especially in lambs, unless early cared for. The facts are, all infantile and nursling diarrhoeas not dependent on secondary causes and organic lesions, even to cholera infantum, present no anatomical changes other than inflammation of the gastro-intestinal membrane.

In an established diarrhoea, one of sufficient moment to demand special therapeutic measures, there is morbid excitability and lowered tonicity of the mucous membrane, and a correspondingly rapid exudation of fluid, mucous or serous, into the alimentary tract, while the reflex excitement of the muscular coat of the bowel tends to free and perhaps forcible expulsion of the diarrhoeal fluid mixed with the remnants of food imperfectly digested. If serous, the loss of fluid constituent of the circulation with its saline ingredients, provoke other morbid conditions; thus the secretions at large are diminished, perverted, or obstructed; the blood becomes thick so that oxygenation is but imperfectly accomplished; and the train of phenomena, primary and secondary, that characterize the malady, rapidly succeed. Now follow inflammatory

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lesions and aphthæ of the intestines, and pyrexia : the muscular and nervous systems, the brain included, become exhausted by imperfect nutrition due to deficient capillary circulation dependent upon poisoning by retained secretions. Meantime the stomach and duodenum are incapable of performing their accustomed functions owing to determination to supply the loss entailed by the diarrhœa, and are unable to supply the fluids essential to nourishment and thus repair waste ; and unless relief is obtained, collapse speedily follows to fatal ending. Zootomy in such cases reveals the stomach and duodenum pale and flabby, or as the seat of violent inflammation ; and the ileum, jejunum, and cœcum denuded of epithelium, with haemorrhagic infarctions and general low inflammatory condition ; and when the dejections are clayey or have been persistently colorless, usually will be found obstruction of the pancreatic duct. Hydrobilrubin, the coloring matter of the fæces, depends upon the mutual reaction of the biliary and pancreatic fluids.

Again, from inanition and exhaustion, perhaps from protoxin poisoning, the poor creature falls into a state of stupor or coma, exhibiting puffy under-eyelids, congested half-closed eyes, cold nose and legs, slow breathing, weak pulse, and the flanks and belly are retracted. This frequently occurs in innoxious scourings when the discharges are abruptly checked, and affords in such case indubitable evidence of toxic production, due to remedial interference.

(To be continued).

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."—VETERINARY RECORD.

MUCOUS CYST IN A DOG.

BY WM. R. CLAUSEN, V.S., Waupaca, Wis.

August 31st a hound, property of Mr. Geo. Howlett of this city, was brought to me for treatment. The dog's eyes

were partially closed; the left eye more so than the right; conjunctiva congested; an abundant flow of tears trickling down the cheeks. Between the jaws, well back toward the neck, was noticed a large, fluctuating, non-inflammatory swelling; a ropy saliva was seen driveling from the mouth; inside the mouth between the tongue and left inferior maxilla was noticed a shining tumor, which increased in size when the exterior swelling was pressed upon. Deglutition was performed without inconvenience. Exploration with the aspirator revealed a substance resembling the white of an egg in the tumor. The sack was opened exteriorally by a free incision and about a pint of the white glary fluid was evacuated. The sack was then injected with argenti nitres grs. xx to water $\frac{3}{4}$ i. Considerable swelling ensued, which gradually disappeared after a discharge of pus was established. The dog was brought to my office to-day and appears well. The eyes are bright and clear, and the swelling has disappeared. I suppose the tumor was one of the mucous cysts mentioned by Professor Williams on page 427 in his Principles and Practice of Veterinary Surgery.

SUCCESSFUL OPERATION FOR THE CURE OF LARYNGISMUS PARALYTICUS OR ROARING IN THE HORSE.

By J. S. BUTLER, V.S., Piqua, Ohio.

At the request of Messrs. Dye & Stillwell, importers and breeders of Shire horses, Troy, Ohio, Dr. T. J. Pence of that place secured a roarer and wished me to operate on him for the cure of that disease as an experiment. Never having operated on such a case, or saw one operated upon, we thought it best to invite several veterinarians to be present and assist and witness the operation. The 12th of June was the day fixed upon for the operation, and the following veterinarians were present: Drs. W. R. Howe and W. Shaw, Dayton; J. Charlesworth, Springfield; W. A. Labron, Xenia; A. H. Logan, Bellefontaine; A. V. Derr, Sidney; T. Kerr, Urbana; T. J. Pence, Troy; J. S. Butler, Piqua.

I was assisted in the operation by Drs. Howe, Dayton and Charlesworth, Springfield; Drs. Kerr, Urbana, and Logan, Bellefontaine, administered the anæsthetic. The subject was an old gelding at least twenty years old, and in an emaciated condition. He had a chronic discharge from the nasal passages with considerable rattling in the head and trachea. The least exertion would cause very loud roaring and upon being severely exerted, the animal would stagger and nearly fall down if not stopped. The readers of this article will no doubt agree with the writer that this was not a very favorable subject for the operation.

The animal was thrown down and secured, and a suitable stage of anæsthesia was reached in about ten minutes. The hair was clipped as closely as possible over the region of the larynx, the skin was sponged with a solution of hydrarg. bi. chlor., then an incision about five inches in length was made in the median line through the skin and muscles, exposing the larynx and trachea. The hemorrhage was controlled by cold water sponging and torsion of some small vessels. When the hemorrhage had entirely ceased the larynx was opened, including the first two rings of the trachea. Considerable mucus mixed with pus escaped from the wound, coming up from the trachea and bronchi.

The true cause of roaring in this case was fully demonstrated, as the left arytenoid cartilage was perfectly immovable, and the muscles of the same side were plainly atrophied, while the right arytenoid and the muscles were in a normal condition and expanded and contracted at each respiratory act. The left vocal cord was severed from its anterior attachment and it, with the arytenoid cartilage, was entirely removed. All partially detached pieces of tissue and shreds of mucous membrane were taken away by the means of curved shears. As the hemorrhage was slight, it was not thought necessary to pack the trachea. What hemorrhage there was was controlled by cold water, antiseptically treated with hydrarg. bi. chlor., and applied with small silk sponges attached to the end of pieces of whalebone. The wound

was left open, as advised by Dr. Fleming, and the operation throughout was conducted as near as possible to his description of the operation in his work just out. After the animal had sufficiently recovered from the anæsthetic he was allowed to rise and walk back to the barn.

A thin piece of gauze was tied around the neck, covering the wound, and kept wet with the antiseptic solution and a little of the solution was injected in the wound. No food or water was allowed for thirty-six hours, when a few swallows of water and some bran and oatmeal gruel was given him, which he swallowed without much difficulty. The throat was dressed antiseptically twice a day, and the diet was confined to gruel for several days, when a little grass was allowed.

On the ninth day after the operation Dr. Pence and I threw the animal again and examined the interior of the larynx and wound. We found it in good condition, except in two or three places the granulations were rather profuse. These we touched with a solution of argentri nitras and continued the former treatment for four weeks, when the wound was about healed. Then a run of seventy-five yards was given him without producing any roaring.

A few days afterward, the wound having healed, the animal was turned out on grass, when the former owner one day, having a curiosity to know what condition he was in, went to the pasture without our knowledge, got on his back and galloped him all over the field, giving him a severe test, but without producing any roaring.

On July 24th, about six weeks after the operation, Drs. Pence of Troy and Charlesworth of Springfield, together with the writer, went to the pasture and tested him thoroughly by running him up hill and in every other way we could, but without producing any roaring. The respirations were somewhat harsh, which was unquestionably due to chronic thickening of the nasal and tracheal mucous membranes.

ELIXIR OF LIFE.

By D. C. ASHLEY, D.V.S., New Bedford, Mass.

Standing beneath the cool, welcome shade
Of the wide-spreading boughs of an old oak tree,
An old horse and cow were awaiting the spade,
In the grave diggers' hands that would soon set them free.
And while they were nibbling and talking together,
Of the trials, and hardships, and trouble they'd seen,
I overheard their sad tales of sorrow,
And wondered if, really, such things had been.
Says the horse to the cow, "My fate has been hard,
For all of my labors, with little to eat.
They have strained all my tendons, and spavined my hocks,
I've been traded around, and cruelly beat."
"Ah! yes," says the cow, "but pray think of me,
When suffering with fever and rheumatics so sore,
They would call the empiric, who with a wise look,
Split the end of my tail, and my horns he did bore.
And when sore afflicted with coughs, colds or pains,
Such nauseous nostrums, that God only knows,
Why I am alive to tell you the tale,
And have not been given as food for the crows."
"Yes, true," says the horse, "and when I've come in,
From a long, tedious drive, heated, hungry and tired,
They have fed me with slops, and with colic I'd swell.
Then they sent for this quack, that our master admired,
Put a boy on my back, and run me for miles;
Then two men with a rail, to rub would begin,
String up my neck, and pour down two quarts
Of the strongest black pepper, and vilest of gin."
"But stop," says the cow, "there will soon be an end,
Of all of our hardships, our troubles and strife,
For as sure as we live, here comes Doctor Brown-Sequard,
With an injection for each, of *elixir of life.*"

SOCIETY MEETINGS.

IOWA STATE VETERINARY MEDICAL ASSOCIATION.

The second annual meeting of the Iowa State Veterinary Medical Association was held in the parlors of the new Savery House, Des Moines, September 3d and 4th.

The following members were in attendance: S. Stewart, Council Bluffs; Geo. J. Howell, Des Moines; Geo. A. Scott, Independence; Geo. A. Johnson, Odebolt; L. G. Patly, Webster City; E. P. Niles, Newton; E. E. Sayers, Al-

gona; M. E. Johnson, Red Oak; Joshua Miller, Ottumwa; A. B. Morse, Des Moines; R. P. Thurtle, Des Moines, and Tait Butler, Davenport.

The following members of the profession were also present as visitors: Drs. F. S. Billings, A. H. King, S. H. Johnson, E. S. Johnston, L. A. Thomas, Hugh Ovens, A. S. Barnes, G. C. Williams, J. W. Scott, J. A. Lawson, Alex. Plummer, J. D. Inger, G. L. Buffington, F. W. Ainsworth, E. Besser, W. S. Igo, T. A. Bown, R. C. Sayers, Fred Edwards and W. H. Sweet.

Routine business occupied most of the morning session, while the afternoon was spent in visiting the State Fair, but the evening session was opened by President Stewarts' annual address, in which was carefully reviewed the progress of veterinary science, especially in the line of literature. The absence of any statistics on the subject of the hereditary transmission of disease was noted, and the appointment of a committee for such work recommended. The idea of making an effort to organize a weekly veterinary journal in the West was also suggested.

The discussion which followed, and in which most of the members participated, resulted in the Association accepting the suggestion of the President in regard to the collection of statistics, and appointing the committee recommended. The members of that committee are, S. Stewart, A. B. Morse and Geo. A. Scott.

Dr. Joshua Miller, of Ottumwa, read an excellent practical paper on certain diseases of the heart, in which he described in a clear and pleasing manner his clinical observations. This paper was also fully discussed by several of the members present.

Dr. Tait Butler, of Davenport, addressed the society on the subject of surgery, especially criticising the neglect of the subject by the veterinary colleges of the continent. He also briefly described his method of castration, especially that of cryptorchids.

During the morning session of September 4th, the following gentlemen were elected members of the Association: S. H. Johnson, V.S., Carroll; G. M. Dunn, V.S., Cherokee; L. A. Thomas, D.V.S., Atlantic; J. T. Kennedy, V.S., West Union; Hugh Ovens, V.S., Hull; A. S. Barnes, V.S., Maquoketa; G. C. Williams, V.S., DeWitt; H. M. Rowe, V.S., Clinton; E. S. Johnston, D.V.S., Morning Sun; J. W. Scott, V.S., Manchester; J. A. Lawson, V.S., Wintersett; Alexander Plummer, D.V.S., Cedar Falls; J. D. Inger, V.S., Strawberry Point; John Tillie, D.V.M., Muscatine; G. L. Buffington, D.V.M., Mt. Pleasant; F. W. Ainsworth, D.V.M., Brush Creek; E. Besser, D.V.M., Harper; W. S. Igo, D.V.M., Indianola; T. A. Bown, D.V.S., Chariton; R. C. Sayers, D.V.M., Fairfield; Gerald E. Griffin, D.V.S., Dubuque; J. E. King, V.S., Anamosa.

The question of legislation was suggested and to bring the matter before the society, it was moved by Dr. Tait Butler, and seconded by Dr. Geo. A. Scott, that a committee be appointed to canvass the members of the profession throughout the State, and ascertain their views as to what is needed in the matter of legislation and report the same, together with the most desirable means for securing such legislation, at the next meeting of the Association. After considerable discussion the motion was carried and the following gentlemen appointed as that committee: L. A. Thomas, G. C. Williams and G. A. Johnson.

The following officers were elected for the ensuing year: President, Tait Butler, Davenport; 1st Vice-President, E. P. Niles, Newton; 2d Vice-President, Joshua Miller, Ottumwa; Secretary and Treasurer, S. Stewart, Council Bluffs; Board of Censors, Geo. A. Scott, Independence; L. E. Sayers, Algona; M. E. Johnson, Red Oak.

At the evening session Dr. G. A. Johnson of Odebolt, read an interesting paper on rheumatism, in which he described a peculiar form of the disease affecting horses' feet, and which he termed lamellar rheumatism. A discussion of considerable length followed the reading of the paper. At the request of the President, Dr. A. H. King, of the Ontario Veterinary College, who was present, addressed the Association on the subject of "Practical Surgery as taught in our Veterinary Colleges."

Dr. F. S. Billings, of the Chicago Veterinary College, who was also present, addressed the society on the subject of Pathology.

Dr. S. Stewart offered the following resolutions, which were unanimously adopted:

Resolved, That Drs. Billings and King be tendered a vote of thanks for their addresses before the society.

Resolved, That Dr. Thomas, of Atlantic, be tendered a vote of thanks for giving a clinical demonstration of rapid anesthesia with the Carlyle chloroform muzzle.

Resolved, That Dr. Tait Butler, of Davenport, be tendered a vote of thanks for his clinical demonstration of ridgling castration and operation for fistulous withers.

Resolved, That Drs. Morse and Howell, of Des Moines, be tendered a vote of thanks for furnishing material and place for the clinical demonstrations.

It is only two years since the present Iowa State Veterinary Medical Association was organized, but it already has a membership of forty-five regularly graduated veterinarians, which is fully seventy-five per cent. of the qualified men in the State.

Iowa veterinarians seem to fully appreciate the necessity of such an organization, and are proud of the fact that, in point of thorough organization and activity of its membership, it is second to no State Association in the Union.

The next annual meeting will be held at Des Moines during the winter of 1890-'91.

TAIT BUTLER, *Secretary*.

AMERICAN PUBLIC HEALTH ASSOCIATION, BROOKLYN.

The seventeenth annual meeting of this Association will be held in the Hall of the Brooklyn Institute, Washington and Concord Streets, October 22d, 23d, 24th and 25th. Addresses of welcome will be delivered by Hon. Alfred C. Chapin, Mayor, on behalf of the city, and by Alexander Hutchins, M.D., on behalf of the medical profession.

The following topics have been selected for consideration at the meeting:

1. The Causes and Prevention of Infant Mortality.
2. Railway Sanitation. (a) Heating and ventilation of railway passenger coaches. (b) Water-supply, water-closets, etc. (c) Carrying passengers infected with communicable diseases.

3. Steamship Sanitation.
4. Methods of Scientific Cooking.
5. Yellow Fever. (a) The unprotected avenues through which yellow fever is liable to be brought into the United States. (b) The sanitary requirements necessary to render a town or city proof against an epidemic of yellow fever. (c) The course to be taken by local health authorities upon the outbreak of yellow fever.
6. The Prevention and Restriction of Tuberculosis in Man.
7. Methods of Prevention of Diphtheria, with Results of such Methods.
8. How far should Health Authorities be Permitted to apply known Preventive Measures for the Control of Diphtheria.
9. Compulsory Vaccination.
10. Sanitation of Asylums, Prisons, Jails and other Eleemosynary Institutions.

There will be an exhibition of sanitary goods and appliances in another large hall close by.

OBITUARY.

JAMES BRODIE, V.S.

On the 17th August at Canon City, Colorado, occurred the death of Jas. Brodie, V.S., at the age of 32.

Dr. Brodie was a native of Canada, and graduated from the Montreal Veterinary College in 1883 at the head of his class, and immediately thereafter became junior partner of the firm of Williams & Brodie, of Bloomington, Ill.

In the fall of 1884 he accepted the position of veterinarian to the Hawaiian Government and removed to Honolulu, H. I. where he promptly made his influence felt by his energetic and judicious action in the control and extirpation of glanders, which was causing fearful ravages among the horses and mules of the little kingdom at the time of his arrival.

After a comparatively brief residence in Honolulu it was found that tuberculosis had fastened itself upon him and in 1887 he found it necessary to quit the Hawaiian Islands, and after a fruitless search for health in California and Colorado, finally succumbed to the dread disease. His brief residence in Illinois gave but little opportunity for many to learn of his worth. To his few acquaintances he was known as a genial, noble-hearted gentleman, an earnest and skillful veterinarian, and, had he lived, would undoubtedly have attained an enviable position in his profession.

W. L. W.

CORRESPONDENCE.

ARMY VETERINARIANS.

Editor Review:

Since the publication of my letter on the V. S. in the U. S. Army in the September issue of the REVIEW, letters of encouragement have poured in upon me at such a rate that it is impossible for me to answer each one individually. The interest taken in the subject by the profession has exceeded my expectations and their promises of assistance have been so sincere that it is without a fear for the result that I now place my bill before the public. To the uninitiated there may seem to be a lot of superfluous material attached to the "act," and for the information of these I will endeavor to herewith furnish a key. The Veterinary Surgeon General, with headquarters in Washington, will be at the head of the corps and will be assisted by the Assistant Veterinary Surgeon General. Six Inspecting Veterinarians, to be assigned respectively to the headquarters of each of the military departments, with one Inspecting Veterinarian to act as purveyor and disbursing officer. Ten veterinarians, to be assigned one to each of the ten cavalry regiments, the assistant veterinarians to be assigned as provided. Section eight provides for the non-graduates who are now in the army and who have spent the best part of their lives in the service of the United States. I think that it is only right that the two most prominent positions should be filled without examination, for the reason that in these positions we require men noted most for their executive ability and thoroughness.

I take this opportunity of thanking all of you who have written me words of encouragement in this connection and only ask that you will stand by the bill for the honor and advancement of the veterinary profession.

GERALD E. GRIFFIN, D.V.S.

DUBUQUA, IOWA, Sept. 16th, 1889.

ELIXIR OF LIFE.

Editor American Veterinary Review:

DEAR SIR.—Since the Brown-Sequard "Elixir of Life" has so electrified the American people that the foremost physicians in the land have taken hold of it for experimentation, and have even this early accredited the fluid a certain degree of virtue as a tonico-nervius, I have considered myself justified in carrying the process of experimentation to beasts of burden.

As yet I cannot say that any definite physiological, toxicological or therapeutical results have been obtained from my operations.

It would seem, however, that the process of injection for purposes of nutrition would be as tenable in the animal as in the vegetable kingdom, where it has long since proved successful.

Absurd as "elixirization" must at first appear to us as medical men, we are forced by the prestige of its author to give it some consideration, and the more we experiment the more will we be forced to continue, so let us hurriedly give the process a "*trial for life*;" extinguish it in the embryo, or credit it with its sought-for "specific virtue," and make it everlasting.

If any "specific virtue" is to be discovered for it, let some enterprising veterinarian harvest the meed of priority.

W. J. TORRANCE, V.S.

CLEVELAND, OHIO, Aug. 15th, 1889.

U. S. ARMY VETERINARY NOTES.

(By Kindness of J. A. WAUGH, V.S., U.S.A.)

W. H. Going, M.R.C.V.S., tendered his resignation as Sen. V.S. 7th Cavalry, U. S. A., to take effect August 19th, 1889.

Frederick W. Hopkins, D.V.S., tendered his resignation as Jun. V.S. 7th Cavalry, U. S. A., to take effect August 31st 1889.

Daniel Lemay, V.S., formerly 1st Cavalry, U. S. A., and

lately employed as V. S. in the Q. M. Dept. at Fort Leavenworth, Kansas, has been appointed Sen. V.S. 7th Cavalry, U. S. A.

Benj. D. Pierce, V.S., M.R.C.V.S., tendered his resignation as V.S. 5th Cavalry, U. S. A., to take effect July 31st, 1889.

Gerald E. Russell, D.V.S., is preparing a new veterinary bill for U. S. army veterinary surgeons.

VETERINARY LEGISLATION.

AN ACT To provide for the Organization of a Veterinary Corps and for the Rank and Pay of the Veterinarians of the United States Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

SECTION FIRST. That there shall be established as a part of the United States Army a Veterinary Corps which shall consist of one (1) Veterinary Surgeon General with the rank, allowances and pay of a Colonel of Cavalry. One (1) Assistant Veterinary Surgeon General with the rank, allowances and pay of a Lieutenant Colonel of Cavalry. Seven (7) Inspecting Veterinarians with the rank, allowances and pay of Majors of Cavalry. Ten (10) Veterinarians with the rank, allowances and pay of Captains of Cavalry and a number—not to exceed fifty (50)—Assistant Veterinarians with the rank, allowance and pay of First Lieutenants of Cavalry.

§ 2. The Veterinary Surgeon General shall be charged under the Secretary of War, with the administration duties of the Veterinary Corps.

§ 3. The Chief Veterinary Purveyor shall be the chief purchasing and disbursing officer of the Veterinary Corps. He shall have, under the direction of the Veterinary Surgeon General, the supervision of the purchase and distribution of the United States Army Veterinary Medical and Hospital supplies, and the purchase, inspection and condemnation of all public animals.

§ 4. Within three (3) months after the passage of this Act the President of the United States shall appoint the Veterinary Surgeon General and Assistant Veterinary Surgeon General, whom, with two Surgeons of the Medical Department United States Army, shall form a Veterinary Examining Board, with the duty to examine such candidates as shall present themselves for examination, and shall report and certify to the Honorable Secretary of War the names of seven (7) candidates who shall have passed the highest examination satisfactory to said board.

§ 5. Within one month after the receipt from said Veterinary Examining Board of the certificates of the seven (7) candidates who shall have passed the

highest satisfactory examination, the President of the United States shall appoint to the various positions immediately Junior to the Assistant Veterinary Surgeon General the said seven (7) candidates, to take rank according to the order of merit certified by said examining board.

§ 6. The Honorable Secretary of War shall thereafter appoint a Veterinary Medical Examining Board selected from the members of the Veterinary Corps to examine candidates for the position of Veterinarian and Assistant Veterinarian and for the promotion of Veterinarians and Assistant Veterinarians to such vacancies as may hereafter occur in the senior positions in the Veterinary Corps of the United States Army except that of Veterinary Surgeon General and Assistant Veterinary Surgeon General, which shall be filled by appointment and without examination.

§ 7. To each regiment of Cavalry there shall be assigned one (1) Veterinarian and one (1) Assistant Veterinarian. To each light Battery of Artillery one (1) Assistant Veterinarian. To the Cavalry School at Fort Leavenworth two (2) Assistant Veterinarians. To Jefferson Barracks two (2) Assistant Veterinarians, and to each military post or depot where the number of public animals exceed seventy-four (74), one (1) Assistant Veterinarian.

§ 8. Veterinary Surgeons in the service of the United States Army as such at the passage of this Act (whether graduates of Veterinary Medicine or not) shall be appointed Assistant Veterinarians without examination on recommendation of their Regimental Commanders.

§ 9. Veterinary Surgeons in the service of the United States Army as such at the passage of this Act, who having served twenty or more years in the capacity of Veterinary Surgeon or otherwise in the United States Army, shall be entitled (after his appointment to the Veterinary Corps) to all the allowances (for length of service as Veterinary Surgeon or otherwise in the service of the United States Army) of the rank of like grade in other branches of the service.

§ 10. No person shall be appointed as Veterinary Surgeon General, Assistant Veterinary Surgeon General, Inspecting Veterinarian, Veterinarian or Assistant Veterinarian in the Veterinary Corps United States Army unless he be a regular graduate of a legally chartered or incorporated Veterinary College or University, and shall have passed (except in the case of the Veterinary Surgeon General) a satisfactory examination before the Examining Board hereinbefore provided, except as provided for in Section VIII. of this bill.

§ 11. No person shall be eligible for appointment to any position in the Veterinary Corps United States Army unless he has had at least one year's experience as a practitioner of veterinary medicine between the dates of his graduation as a Veterinarian and that of his application for examination for appointment to said Veterinary Corps, and no person over thirty-five (35) years of age shall in any case be appointed to any position in said Veterinary Corps except in the case of the Veterinary Surgeon General, Assistant Veterinary Surgeon General and those provided for in Section VIII. of this bill.

§ 12. This Act shall take effect immediately.